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## LETTERS TO THE EDITOR.

## The reefs, keys, and peninsula of Florida.

THE recent appearance of the admirable memoir of A. Agassiz on the reefs of Florida, which I have read with intense pleasure, furnishes me a proper occasion for calling attention to my paper, published in 1857, 'On the agency of the Gulf Stream in the formation of the peninsula and keys of Florida,'<sup>1</sup> and especially to the fact that the most important results reached in that paper have been substantially confirmed by subsequent observations. These results are as follows:—

1. The reefs of Florida are unique, and therefore were formed under peculiar conditions, and therefore, also, require a peculiar explanation.
2. The continuous growth of land by coral agency, in the case of Florida, is also wholly unique, and obviously connected with the peculiar conditions under which the reefs were formed.
3. The main peculiar condition in this case was the formation and southward extension of a submarine bank upon which the corals grew in successive reefs.
4. This bank was due to the agency of the Gulf Stream.

In addition, I supposed that the bank was built up by mechanical sediments brought by the Gulf Stream mainly from the Gulf rivers. In this I may have been mistaken, although no other explanation was conceivable at that time. The recent examinations of the course of the Gulf Stream, which, it seems, does not sweep about the Gulf, as was formerly supposed, and examination of the nature of the material forming the Florida bank, render this view no longer probable.

A. Agassiz in his memoir accepts the progressively formed bank, and also that it is due to the agency of the Gulf Stream, but thinks that it is formed, not by mechanical sediments, but by organic sediments, partly brought by the Gulf Stream from other coral banks (e.g., the Yucatan bank), but mainly formed *in situ* by the growth of deep-sea animals; the Gulf Stream bringing not the materials, but only the conditions of heat and abundant food necessary for rapid growth.

This is certainly a very important modification of my original view; but the fundamental ideas expressed in the above four propositions still remain.

I ought to add, that, following L. Agassiz, I had exaggerated the probable amount of land added to Florida by the combined agency of Gulf Stream and corals. The recent investigations of Smith<sup>2</sup> on the geology of Florida show that the process cannot have commenced farther north than the north shores of the Everglades.

JOSEPH LECONTE.

Berkeley, Cal., Nov. 24.

## Musical sand.

In the early part of the summer of 1883, the writer, in company with several others, was sent from Wood's Holl to Monomoy Point, Mass., by Professor Baird, to look after a whale reported to have been stranded there. Wandering around the island, we found an extensive tract of sand, which, when rubbed under the feet, produced that peculiar singing sound so often heard by the writer upon the beach at Manchester, Mass. The singing portion seemed to be confined to a narrow strip several hundred yards long, between the very dry sand above high-water mark and the sand moistened by the tides. Knowing that the phenomenon was a rare one, specimens of the sand were obtained; but I am not able to tell where they are at present. Monomoy Point is a

<sup>1</sup> *Amer. Journ. sc.*, Jan., 1857.

<sup>2</sup> *Ibid.*, 1881.

long, narrow, sandy piece of land projecting out from the south-eastern end of the base of Cape Cod towards Nantucket Island. It is composed entirely of sand; and the blowing of the particles, as also the force with which they are blown, were well illustrated by the fact that all the windows of the fishermen's huts were ground so perfectly that nothing was visible through them. We paid one fisherman to break a square of glass for us. It had been there sixteen years. Even in cases where new glass had been put in within two years, nothing was visible through the panes. At a distance of thirty feet from the house on all sides, sand was piled up nearly as high as the tops of the cabins. The lighthouse-keeper upon the island would undoubtedly obtain specimens of the sand; the strip being found near the place where the whale lay, — in fact, just a few feet inland from it. The writer will be glad to give any further information desired upon the subject.

R. S. TARR.

Smithsonian institution, Dec. 4, 1883.

## Rings of Saturn.

Apropos of the abstract on the 'Rings of Saturn,' published in SCIENCE for Nov. 16 (p. 660), it appears that Professor Alexander Winchell of the University of Michigan, in his work entitled 'World-life,' assumed and explained the gradual descent of the matter of the rings toward the planet, and also denied that the period of the inner satellite of Mars furnishes any objection to the nebular theory. The ultimate result of solar tides on the rotations of the planets is also referred to in the same work, though this has, I believe, long been an accepted conclusion by leading physical astronomers.

W. B. T.

## ARCHEOLOGY IN PORTUGAL.

*Études préhistoriques en Portugal. Notice sur quelques stations et monuments préhistoriques. Mémoire présenté à l'académie royale des sciences de Lisbonne.* Par CARLOS RIBEIRO, chef de la section des travaux géologiques, etc. Lisbonne, Imprimerie de l'académie des sciences, 1880. 88 p., 7 pl., and numerous engravings in the text. 4°. [Also in Portuguese.]

This publication, which has only recently been received by us, is the second instalment of a work the first of which appeared in 1878 (72 p., 21 pl.). We will accordingly give a brief account of the contents of both parts. Contrary to our expectations, we find in them no discussion of the important question of the alleged discovery of traces of the tertiary man in the valley of the Tagus; neither do they deal with quaternary times. They contain simply detailed accounts, with ample illustrations, of various discoveries, all belonging to the age of polished stone, made by the author in several localities in the immediate neighborhood of Lisbon, which are all laid down upon an accompanying map drawn to a large scale. The completed work will comprise six sections, three of which are contained in the two portions already published. Of these, the first describes the station of Licea, and the second,